

A NEST OF A SOCIAL WASP,
VESPA AFFINIS, IN THAILAND
(HYMENOPTERA: VESPIDAE)*

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The nests of the tropical *Vespa* species are very poorly known. Van der Vecht (1957) reviewed what little was known as of the early 1950's, and since then only a few additional reports have appeared (Sakagami and Fukushima 1957, van der Vecht 1967, Matsuura 1971a, b, 1973, Matsuura and Sakagami 1973, Yamane 1977, Yamane and Makino 1977, Makino and Yamane 1980, Kojima and Yamane 1980). We now report observations made on a *Vespa affinis* nest in Thailand.

We found the nest in a residential area in Bang Khen, a district on the northern outskirts of Bangkok. The nest hung in a mango tree (*Mangifera indica*) where it was thoroughly shaded and concealed by the tree's thick foliage. The nest bottom was 1.4 m off the ground. We first observed the nest on 13 October 1979, at which time the nest was occupied by an evidently strong colony of wasps. During the daytime about 30 wasps, apparently guards, were scattered over the nest's outer surface and there was strong flight to and from the nest. Several wasps were collected and have been placed as voucher specimens in the entomology collection of the Peabody Museum, Yale University. When we reexamined the nest on 21 October 1979 the wasps were gone. The people in whose yard the nest was built said the wasps had left earlier that day. We do not know why the wasps abandoned their nest. Many small ants (species undetermined) were scavenging on pupae left in the nest, but we do not know whether these ants had previously been attacking the wasp colony and so perhaps caused its absconding, or whether the ants had invaded the nest only after the wasps abandoned it. The owners of the nest reported that during the wasps' approximately 9-month residence in their yard the wasps had not been disturbed by humans.

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Figure 1. A nest of *Vespa affinis* in Thailand. Much of the vegetation which originally hid the nest has been removed. Also, the envelope which originally enclosed the combs has been removed to reveal the nest's interior architecture. The ballpoint pen is 14 cm long.



Figure 2. The same nest as in figure 1, but as seen from the side opposite that shown in Figure 1. The covering envelope is intact. Ruler is 15 cm long

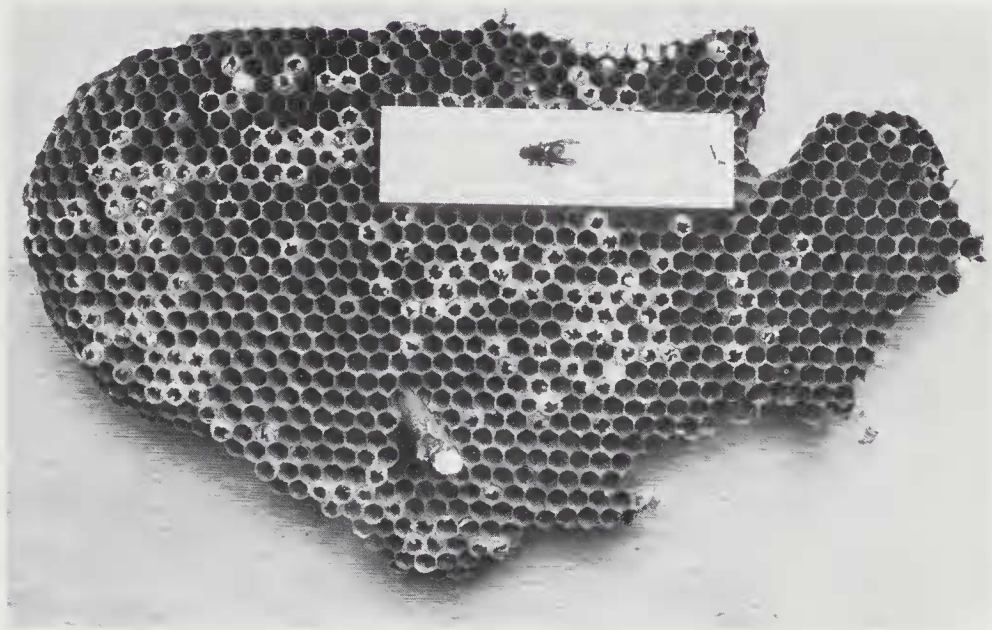


Figure 3. Bottom comb from the nest shown in figure 1. Notice the cells containing pupae, which were abandoned by the wasps, and which ants have torn open. Ruler is 15 cm long.

Figure 1 shows a side view of the nest with the covering envelope removed; figure 2 shows the opposite nest side with the envelope intact. The nest's maximum outside dimensions were 69 cm wide, 60 cm high, and 40 cm deep. The envelope consisted of a single paper layer up to 1 mm thick which completely enclosed the nest's combs. Two holes in the nest bottom, each of area approximately 8 cm^2 , provided passageways into the nest. Above the six horizontal layers of paper comb was a cone-shaped structure consisting of paper layers and air pockets (see figure 1) and the remnants of a seventh, perhaps the original, comb. Other published photographs of *Vespa affinis* nests in India (Chopra 1926) and Malaya (van der Vecht 1957) show an even more pronounced roof cone. Van der Vecht (1957) has suggested that this structure helps shed water from the nest during torrential rains.

Figure 3 shows the nest's bottom comb. We measured the size of the nest's comb cells by measuring the wall-to-wall cell diameter across 10 cells in a row. Repeating this measurement 12 times gave a mean ± 1 standard deviation of $9.3 \pm 0.2\text{ mm}$ for the wall-to-wall cell diameter. A perfectly symmetrical hexagon of this size would enclose an area of 75 mm^2 . This value, together with estimates of the area of each comb (measured with a tape measure), yielded an estimate of 9600 cells total for the nest's 6 combs. The combs varied in thickness between 23 and 30 mm. A "wasp space" of approximately 16 mm between adjacent combs and between the edges of the combs and the envelope provided passageways throughout the nest. The combs were supported by short vertical pillars between adjacent combs.

As is shown in figure 3, the wasps left behind several cells containing pupae when they abandoned the nest. By the time we dissected the nest the ants had perforated the white pupal cell cappings and were eating the pupae. We found no eggs or larvae in any of the other cells. Evidently, either the wasps waited until most of the last generation of brood had emerged before absconding, or the ants had removed all the eggs and larvae earlier in the day. We doubt the small ants could have cleaned out the nest, had it been filled with brood, in the relatively few hours between the wasps' departure (as early as sunrise, about 0600 hours) and our dissection of the nest (at 1400 hours). Thus it appears that these wasps can perform colony movements for which they prepare by ceasing brood rearing long before departing the old nest.

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